RECEIVED

DOCKET FILE COPY ORIGINAL

MAY 27 1993

FEDERAL COMMUNICATIONS COMMISSION
OFFICE OF THE SECRETARY

1755 N. Racine St.
Appleton, Wi. 54911

5-20-93

RECEIVED
MAY 27 1993
FCC - MAIL ROOM

Office of The Secretary
Federal Communications Commission
Washington, D.C. 20554

Dear Sirs,

I am writing you in response to the Notice of Proposed Rule Making PR Docket No. 92-235 regarding the replacement of part 90 with part 88. I sent you a response to this earlier this year in order to meet the inital response deadline, but now, with the deadline extension, I would like to expand upon my earlier letter, since I have now had a chance to thoroughly examine your part 88 proposals. I am also sending you this letter since I did not receive any reply to my first letter.

As described on page 12 of this NPRM, I am enclosing an original plus 9 copies of this document, so that each Commissioner may receive a personal copy of my comments. I hope by sending this many copies, that this time you will find time to send me a reply to my letter, or to call me. I may be reached at 414-734-9876 (days) or 414-739-9395 (evenings).

As the holder of an Amateur Advanced Class (WB0RAG) and General Radio Telephone Operator's Licenses(PG-18-8642), I am familiar with many of the rules and regulations of the F.C.C.. I have a great love for radio, so I felt compelled to write you to describe how I felt your proposal would affect the mobile services in general, as well as how it would affect another hobby of mine, radio control flying. To best describe my views, I will cited specific parts of your NPRM and give you my comments.

88.425 FREQUENCY STABILITY REQUIREMENTS

This portion of part 88 specifies a basic stability requirement of 50 PPM for mobile, and 5 PPM for fixed stations operating in the 72-76 MHz band for example. If you review the frequency stability of "off the shelf" crystals, you will find that most manufactures don't come anywhere near these tolerances on a routine basis. Attachments 1a and 1b show typical crystal specifications from 3 major crystal manufactures; Epson America, ECS and CTS. These specifications are cited in the most recent Digi-Key Catalogue (701 Brooks Ave South, Thiel River Falls, MN.) and are quite representative of what is available in stock crystals. The specifications of these crystals are in the +/- 20 ppm to +/- 200 ppm inital accuracy, with +/- 10 to +/- 20 ppm per year drift, and +/-50 ppm to +/- 100 ppm drift over commercial temperature range (-10 to +70 Degrees C).

No. of Copies rec'd 0+9
List A B C D E

To be fair with these crystal specifications, I enclosed all crystal specifications from this company and have not "played" with the data in anyway.

With the crystal tolerances cited above, it is not practical to implement the close spaced channels of part 88. None of the crystals listed in the Digi-Key catalogue is capable of meeting and holding even the 50 ppm specification, even with tuning. Of course it is totally unfeasible to meet the 5 ppm specification, based on these crystal specifications. In order to meet these type of frequency tolerances, it will be necessary to employ high priced circuits, including crystal ovens and the like. Definitely not a system designed for the masses!

Another way of looking at the feasibility of these frequency tolerances is to look at what's available commercially for laboratory grade signal generators to work at these frequencies. Attachment 2 shows the specifications for 3 current Hewlett-Packard signal generators that cover the range of frequencies cited in part 88. The cost of these generators range from $6,720 to $13,660 and represent the state of the art in synthesized signal generation. As shown in Attachment 2, these high quality generators have aging rates of +/- 2 PPM per year. At that rate, all of these generators could be out of tolerance in 3 years if used as a signal source for a base station part 88 transmitter!

Also attached are specifications for the HP 8657b generator. Besides showing a 2 PPM aging rate, these specifications also show a +/- 10 ppm specification for the generator over 0-55 deg. C. Again, this shows how unreasonable the 5 PPM frequency accuracy is in part 88 since this generator could not meet it in even for a temperature range narrower that

KHz then we get a channel spacing of 26.6 Khz to insure reliable interference free channels. This is a far cry away

the F.C.C. is to realize the importance of reliable control for the modeler. The R/C modeler should be given Primary User status in the 72-75 MHz band.

Emerging Telecommunications Act of 1993

As you are aware, earlier this year, Congress passed this act to free up 200 Mhz of Government held spectrum for private use. Many of these frequencies were set aside for military use, and were seldom used. Since this large spectrum is now available for you to reassign, it only seems natural that these frequencies be setup for new land-mobile use.

Since most of these frequencies are higher than 72-75 Mhz, they are better suited for mobile use anyways. As you know, frequencies higher than 75 Mhz, are less prone to "skip"(or interference from non-local users), and use smaller

The current plan calls for 200 channels in the 72-76 MHz band, 8 channels in the 25-50 MHz band, 28 in the 150 to 174 MHz band and 538 in the 450-470 MHz band. Obviously changing the rules to make 8 channels in the 25-50 MHz or 28 channels in the 150-174 MHz bands seems hardly worth the effort, especially if it affects current equipment. This leaves the 200 channels in the 72-76 MHz band and the 538 channels in the 450-470 MHz band.

Keeping with the idea that a single band is the best route, and factoring in the advantages of using higher frequencies cited above (smaller antennas, less skip, less atmospheric noise, better building penetration, more potential users in a smaller area due to line of sight communication, etc) it makes the most sense to keep the 450-470 band and try to expand its frequency limits higher. If this is not possible, it makes more sense to find a larger contiguous area in the newly opened frequencies authorized in the Emerging Telecommunications Act of 1993.

Developemental Operations page 280 88.1401

In this part of this NPRM, the Commission describes standards for use of special frequencies for developement purposes. The idea seems to be be that we need a place for people to developed new communication methods, or to do experimentation. This type of developmental work is exactly what the Amateur Radio Service was designed for.

Historically, Hams have been the first to make many technical advances in the radio art. Why even in the question pool for the Amateur licence (subelement 2a-Commission's Rules), it is stated that "technical advancement" is one of the 5 principles for which the Amateur Service was designed. Yet, over the years, the F.C.C. has reduced the developmental aspect of Amateur radio, by passing strict regulations against it.

Specifically, in part 97.301 to 97.307, pertaining to Amateur operation, emission types are stated, frequency bands are cited, and especially in 97.307 tough rules are put down to prevent a ham from building equipment that operates above 30 MHz. I think it is necessary for Hams to have rules to guide their everyday operations, so in general these rules are good and quite necessary. But unfortunately these rules prevent Amateurs from doing any experimentation or "developemental" work on easily used frequencies. Amateurs cannot develop new emission types, or test out new transmission methods with the part 97 rules as they stand.

It seems highly unfair that Amateurs that have to pass a technical exam, and who are known to police themselves extremely well, are prohibited from experimentation, while

anyone who fills out a form, with or without technical ability under proposed part 88, could apply for special frequencies for experimentation. Furthermore, there are NO technical restrictions put on these proposed part 88 developemental activities. My feeling is that this type of activity should at least require an Amateur licence at a minimum and the Amateur rules should be modified to reflect this type of activity.

Rather than create a new band and more paper work to allocate it, why not redo part 97 to allow any Amateur operator to do developmental work. Then, if some corporation wants to do developmental work, make their personnel get an Amateur license before they can proceed. 88.1401 seems to run counter to the Paper Work Reduction Act, since it invokes a new form for something that should be handled by the existing Amateur licence. By making an Amateur license necessary for developemental work, the user is required to be aware of F.C.C. rules and regulations, as well as know what is the current state of the art in a broad sense. This certainly can only help the developemental process, and will hopefully prevent some unfortunate violations. Furthermore, there is a very large pool or potential "developers" out there that already have ham licences. By making experimental frequencies available to them, you will make hams more technically competent, and will make America more competitive.

What's Missing From Part 88

While this NPRM goes to great lengths to create commercial services and services for local governments, it is completely lacking in providing services for the general public. The public would be well served if this part created a series of channels for general use in the UHF or VHF bands. Currently the public is generally limited to 27 MHz for general purpose communications. This band is prone to skip, and because of this, it is very congested. Furthermore the 11 meter wave length of this band makes it difficult to get good small antennas. Lastly, this band requires AM modulation (or SSB) so atmospheric noise is a big problem. So what the public needs is a good UHF or VHF band where FM is allowed, and 1 watt of power is allowed. Such a system could enhance public safety, much the way the current marine bands help boater safety. Campers and hikers could use these frequencies, as well as mothers, kids and families that need to keep in touch in the malls or around the block.

Availability of NPRMs and F.C.C. information to the general public

My last comment concerns the effort I had had to go to get

this NPRM for review. After making several calls to various F.C.C. offices, I found that this 400+ page NPRM is not available from the government. Rather, it was "only" obtainable from a private printing office, at what I consider a high cost. After talking to my congressmen about this, he promised to get me a copy. His efforts spanned over 2 months and at least a dozen phone calls before I finally got a copy. I personally know the effort that was required to get the NPRM since I visited his office regularly. While he was promised a copy several times by the F.C.C., the "ball was dropped" several times and it took well past the inital reply deadline before I finally got my copy.

In the past, the F.C.C. has made effective use of the government printing office to publish its regulations at reasonable cost. Recently however costs and availability have gotten out of line, and I think the regulation process has suffered for it. This is not the only case I can think of. For example, to obtain a set of part 97 rules from the F.C.C. it costs over $20 and comes with several other parts that don't pertain to Amateurs. I however can obtain part 97 from W5YI press for about $5.00. I think it is necessary for the F.C.C. to adopt better methods of sending out information. If your methods were better, you could expect more than the 120 special interest comments received when drafting this NPRM.

Perhaps you might consider making these documents available on disk or cd rom in compressed form.

Summary

In closing, the basic goals behind part 88 are good. The benefits from a well implemented Land/Mobile service would be many. Its implementation would help in making business more competitive, and would enhance public service efforts. It could also create new jobs making the radios that operate under part 88. However, we must be careful not to design a plan that causes dangerous situations, is technically not feasible or causes unreliable communication. With some modification part 88 can be made into the cornerstone of a new communication system!

Sincerely yours,

David Beck

David Beck WB0RAG PG-18-8642

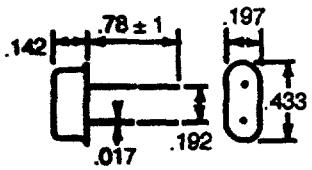
ECS

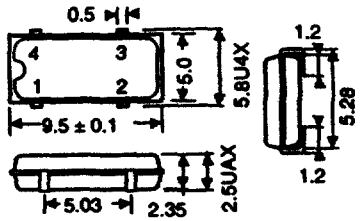
NEW! ECS, INC.

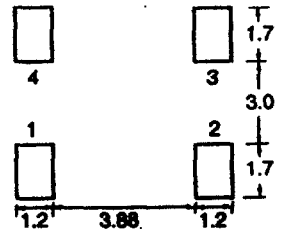
ECS-8F SMD CMOS Crystal Oscillators

Frequency Stability: ±100ppm.
Operating Temperature: -10~+70°C.
Power Supply Voltage: 5.0±0.5V.
Duty Ratio: 40-60%

HC-49/US







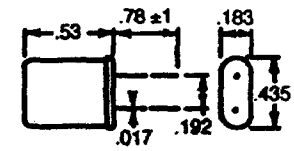
#1 Pin	#3 Pin
H	Oscillation
L	High Impedence

No.	Function
1	Enable/Disable
2	GND
3	OUT
4	VDD

Specifications: Operating Temp. Range: -10 ~ 70°C. Frequency Tolerance: At Cut ±50 ppm @ +25°C, ±100 ppm from 0°C to +70°C. Drive Level: 1mW.

ECS

HC-18

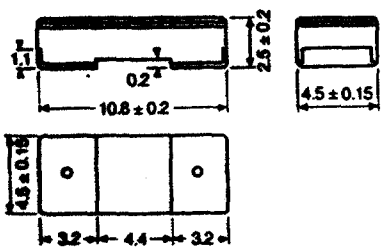


Solder welded case HC-18 has same dimensions as HC-49. Common To All Frequencies: At Cut ±50 ppm @ +25°C. ±100 ppm from 0°C to +70°C. Aging 10 ppm per year max., Shock 100 G's for 11 Mil Sec, Vibration 3 G's 0 to 60 cps. The drive level normally referenced in milliwatt is dissipated power between two crystal leads. Drive level should be the minimum necessary to begin and maintain crystal oscillation, to assure optimum performance and stability. Excessive drive can result in breakage of the crystal element, excessive frequency drift, and poor aging characteristic.

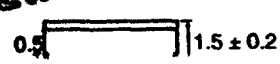
ECS, INC.

Electrical Specifications: Operating Temperature Range: -10 to 70°C. Frequency Tolerance: 650 ppm. Drive Level: 1mW.

ECX-11



NEW! **ECX-6**



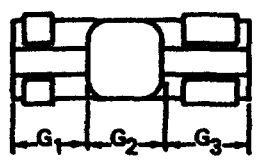
CTS®

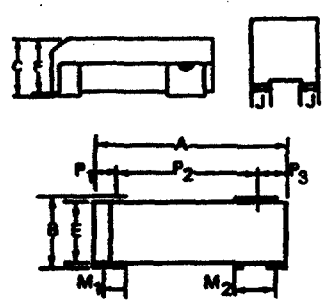
Microprocessor Crystals

- Frequency Tolerance ± .005% (50PPM) @ 25°C
- ± .005% (50PPM) 0°C to +70°C
- Fully Hermetic Package
- Low Start-Up Resistance

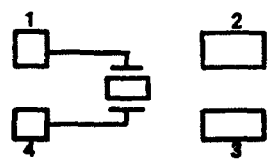
ECX-3A

Surface Mount!





Pin Layout and Internal Circuitry

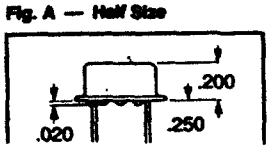


Ref.	Min. (in.)	Nom. (in.)	Max. (in.)
A	—	—	.516
B	—	—	.197
C	—	—	.197
E	.169	.173	.177
F	.177	.181	.185
G1	.154	.157	.161
G2	.165	.169	.173
G3	.177	.181	.185
J	.043	.047	.051
M1	.059	.063	.067
M2	.114	.118	.122
P1	.051	.055	.059
P2	.366	.370	.374
P3	.079	.083	.087

It has a special high temperature seal which is able to withstand SMD soldering techniques. Housing for this crystal is made from the same rudded thermoplastic that is standard for integrated circuits. **Features:** Economical Cost, Space Saving Design, Surface Mount. **Specifications:** **Operable Temperature:** -30°C ~ +90°C. **Operating Temperature:** -10°C ~ +70°C. **Frequency Tolerance:** ±50 ppm @ 25°C, ±100 ppm from -10°C to +70°C. **Capacitance, Shunt:** Less than 7pF. Insulation Resistance: More than 500MΩ

CTS Clock Oscillators

Fig. A — Half Size

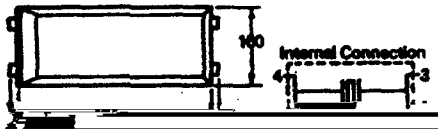


Pin # Fig. A	Pin # Fig. B	Connection
#1	#1	NC
#4	#7	Ground
#5	#8	Output
#8	#14	+5 V DC

- Freq. Tolerance ± 100 PPM 0°C to 70°C
- Fully Hermetic Resistance Weld Package
- 8/14-Pin Compatible
- Drives Up To 10 Std. TTL Loads
- C-MOS Compatible
- Input Voltage +5 V DC ± .5V

EPSON AMERICA, INC. **Surfac**

MC-405



EPSON AMERICA, I

Cylinder-Type Quartz Crystals

Specifications describe the instruments warranted performance and apply after a 30 minute warm-up. These specifications are valid over the signal generator's entire operating/environmental range unless otherwise noted.

Supplemental Characteristics (shown in *italics*) are intended to provide additional information, useful in applying the instrument by giving typical (expected), but not warranted performance.

Range (10-digit LED display): 100 kHz to 2060 MHz.